

APPENDIX C

GIS Analysis of Pre-Development Landscape Features around Lake Istokpoga

INTRODUCTION

An analysis was conducted to examine pre-development hydrogeographic patterns and landscape features of the Lake Istokpoga area. Information on pre-development conditions was obtained from the public land survey maps and field notes and from soil survey information. This information was used to compile a comprehensive pre-development map of the Lake Istokpoga watershed. The results of this analysis provided clues to important landscape level characteristics of the original lake system and insights into the ways in which subsequent changes may have impacted the resource.

METHODS

General Land Office Survey Map of Pre-Development Conditions

A map of major landscape features was obtained from the 1870 General Land Office (GLO) survey field notes. These maps were acquired for 16 Township/Range blocks (**Table C-1**) and were joined into a single map. Features along map borders were edge-matched and the comprehensive map was geo-rectified in ArcInfo and converted to a Geographic Information System (GIS) coverage. Field notes from the GLO survey for the Lake Istokpoga area were acquired from the Florida Department of Environmental Protection's Land Boundary Information System (LABINS) website <http://www.labins.org/glo>.

Pre-Development Vegetation Community Map from County Soil Survey Database

Soil taxonomic characteristics can be used to infer long-term hydrological conditions at a site. Using a relationship between vegetation community type and average hydrological conditions for a soil taxon, a map of the extent of pre-development vegetation communities was developed (Zahina *et al.* 2001) and was verified by GLO survey field note information. A table of GLO vegetation types along section lines was used to compare data from soil surveys in four Township/Range blocks around Lake Istokpoga (**Table C-2**).

Table C-1. Township/Range Blocks Used to Construct a Map of Lake Istokpoga Watershed Features

Township	Range
34 South	29 East
34 South	30 East
34 South	31 East
34 South	32 East
35 South	29 East
35 South	30 East
35 South	31 East
35 South	32 East
36 South	29 East
36 South	30 East
36 South	31 East
36 South	32 East
37 South	29 East
37 South	30 East
37 South	31 East
37 South	32 East

Table C-2. Section Transects Examined for Descriptions of Vegetation in the Lake Istokpoga Area.

Township	Range
35 South	31 East
35 South	30 East
36 South	30 East
36 South	31 East

RESULTS OF ANALYSIS

Major Pre-Development Landscape Features of the Lake Istokpoga Area

The comprehensive map of the Lake Istokpoga watershed generated from the original land survey maps provides insight into the characteristics of the pre-drainage landscape (**Figure C-1**). Among the most notable features are the extensive unsurveyed perennial wetlands to the immediate southeast of the lake and the system of smaller lakes on the southwest side, including Lake Cram, which no longer exist. The map also identifies the historic meander of the four major tributaries included in the analysis (Arbuckle Creek, Josephine Creek, Istokpoga Creek and the unnamed stream on the SW side of the lake).

Field notes and maps from the GLO were examined to determine the different vegetation community types described by the surveyors. In some cases, the distinction between some community types was not clearly defined, as the GLO notes were intended to provide general descriptions of the landscape with respect to usability of the land for settlement, agriculture and resources. For instance, the term “prairie” indicated a treeless plain usually dominated by grasslike plants. Modern definitions of community types in Florida define different types of prairie, namely “wet prairie” (seasonally inundated) or “dry prairie” (associated with flatwoods and not wetlands). Examination of the field notes, maps and context of the observations usually provided clues as to which type of prairie was implied.

These vegetation community types along section transects in the Lake Istokpoga area were compared with vegetation types as inferred from soils (**Table C-3**). Of the 165 section lines studied, 34 (21 percent) had insufficient data to make a comparison between sources. Of the remaining 131 section transects, 123 (94 percent) had a complete or partial match of information between the two sources and eight (6 percent) had disagreement. A complete match occurred when both data sets provided the same information to the same level of detail. A partial match of information occurred when more detail (i.e., more community types) was given in one data set than another.

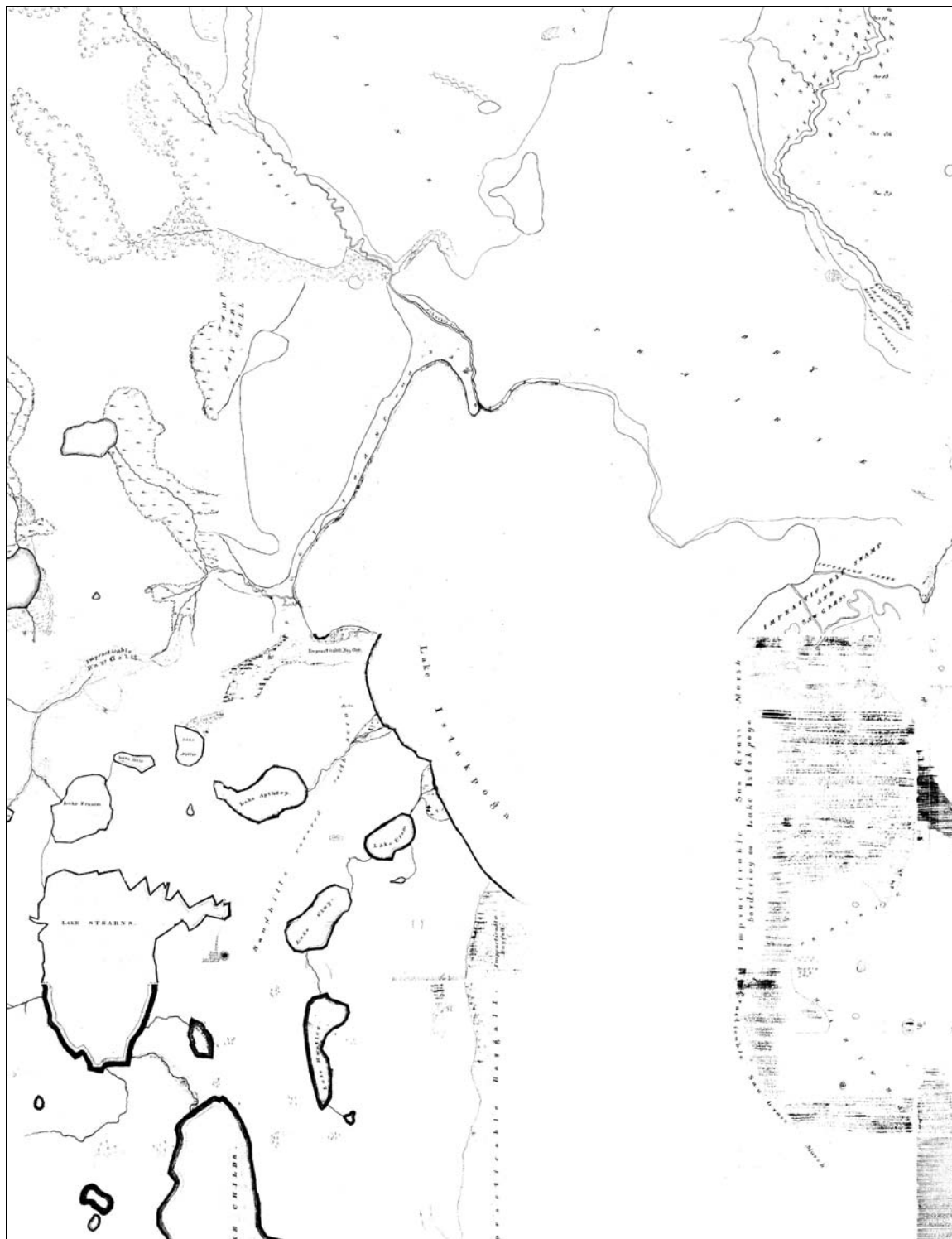


Figure C-1. Composite Map of the Lake Istokpoga Area from 1870 General Land Office Survey Maps.

Table C-3. Comparison of Field Observations of Historic Vegetation with Soil-Inferred Vegetation Communities

Township/Range/ Section	1870 GLO Field Survey¹	Soil-Inferred Pre- Drainage Vegetation²	Agreement³
35S/31E/1-2	Cane grass; 3rd rate pine	Wetlands, Flatwoods	A
35S/31E/2-11	3RD rate (dry) prairie	Flatwoods	A
35S/31E/2-3	3RD rate (dry) prairie	Flatwoods	A
35S/31E/3-10	No data	Flatwoods	I
35S/31E/3-4	3RD rate (dry) prairie	Flatwoods	A
35S/31E/4-9	3RD rate (dry) prairie	Flatwoods	A
35S/31E/4-5	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/5-8	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/5-6	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/6-7	Prairie (wet), 3rd rate sand	Wet prairie	A
35S/31E/7-8	Prairie, 3rd rate sand	Flatwoods, wet prairie	A
35S/31E/8-9	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/8-17	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/9-10	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/9-16	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/10-11	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/10-15	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/11-12	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/11-14	Prairie (dry) , 3rd rate sand	Flatwoods, Wetlands	A
35S/31E/12-13	Prairie (dry) , 3rd rate sand	Flatwoods, Wetlands	A
35S/31E/13-24	Prairie (dry) , 3rd rate sand	Flatwoods, Wetlands	A
35S/31E/13-14	Prairie (dry) , 3rd rate sand	Flatwoods, Wetlands	A
35S/31E/14-23	Prairie (dry) , 3rd rate sand	Flatwoods, Wetlands	A
35S/31E/14-15	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/15-22	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/15-16	Prairie (dry) , 3rd rate sand	Flatwoods, wet prairie	A
35S/31E/16-21	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/16-17	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/17-20	Prairie (dry), sand, (cypress), lake	Flatwoods, wetlands	A
35S/31E/17-18	Lake, (cypress), wetland	Flatwoods, water	A
35S/31E/20-21	Prairie (dry), scrubby, 3rd rate sand	Flatwoods	A
35S/31E/20-29	Prairie (dry), scrub, 3rd rate sand, lake	Flatwoods	P
35S/31E/21-22	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/21-28	Prairie, 3rd rate sand	Wetlands, wet prairie	A
35S/31E/22-23	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/22-27	Prairie (dry) , 3rd rate sand, Istokpoga Creek with assoc wetlands	Flatwoods	P
35S/31E/23-24	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/23-26	Istokpoga Creek with assoc wetlands	Flatwoods, Wetlands	A
35S/31E/24-25	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/31E/26-27	Unsurveyed, lake area	Flatwoods	I

Table C-3. Comparison of Field Observations of Historic Vegetation with Soil-Inferred Vegetation Communities (Continuation).

Township/Range/ Section	1870 GLO Field Survey¹	Soil-Inferred Pre- Drainage Vegetation²	Agreement³
35S/31E/27-34	Unsurveyed, lake area	Wet prairie, wetlands	I
35S/31E/27-28	Unsurveyed, lake area	Wetlands	I
35S/31E/28-33	Unsurveyed, lake area	Flatwoods, wetlands	I
35S/31E/28-29	Swamp, wet prairie, lake (fringe)	Wetlands, flatwoods	P
35S/31E/29-32	Unsurveyed, lake area	Wetlands, flatwoods	I
35S/31E/32-33	Unsurveyed, lake area	Water	I
35S/31E/33-34	Unsurveyed	Flatwoods	I
35S/31E/34-35	Unsurveyed	Flatwoods, wetlands	I
35S/30E/1-2	Prairie (dry) , 3rd rate sand	Flatwoods	A
35S/30E/2-11	Prairie (dry) , 3rd rate sand, Arbuckle Creek wetlands	Flatwoods	P
35S/30E/2-3	Water (lake fringe)	Wetlands	P
35S/30E/3-16	Willow, sawgrass, boggy, inundated	Wetlands	A
35S/30E/3-4	Low muddy dark rich soil	Flatwoods, Wetlands (Arbuckle Creek floodplain)	A
35S/30E/4-5	Unsurveyed	Flatwoods, Wet Prairie	I
35S/30E/5-8	Pine, prairie, 3rd rate sand	Scrub, Flatwoods	A
35S/30E/5-6	Boggy swamp, 3rd rate pineland	Wetlands	P
35S/30E/6-7	Bay swamp	Wetlands	A
35S/30E/7-8	Prairie, pine island	Flatwoods	A
35S/30E/7-18	Prairie, boggy pine, swamp	Flatwoods, Wetlands	A
35S/30E/8-9	Prairie, 3rd rate sand	Flatwoods	A
35S/30E/8-17	Prairie, 3rd rate sand	Flatwoods	A
35S/30E/9-10	Sawgrass, lake	Flatwoods	D
35S/30E/9-16	Prairie, 3rd rate sand	Flatwoods	A
35S/30E/10-11	Arbuckle Creek, wetlands	Wetlands	A
35S/30E/11-12	Prairie, 3rd rate sand	Flatwoods, wetlands	A
35S/30E/12-13	Unsurveyed lake	Wetlands	I
35S/30E/13-14	Unsurveyed lake	Flatwoods, wetlands	I
35S/30E/14-23	Unsurveyed lake	Wetlands, wet prairie	I
35S/30E/14-15	Unsurveyed lake	Uplands	I
35S/30E/15-22	Unsurveyed lake	Flatwoods, no data	I
35S/30E/15-16	Sawgrass	Wetlands, no data	I
35S/30E/16-21	Sawgrass, boggy & impassible wetland	Wet prairie, wetlands	A
35S/30E/16-17	Prairie, pine island, 3rd rate sand	Flatwoods, no data	I
35S/30E/17-20	Prairie, 3rd rate sand	Flatwoods, wet prairie	A
35S/30E/17-18	Prairie, 3rd rate sand	Flatwoods, uplands	A
35S/30E/18-19	Prairie, 3rd rate sand, pinelands	Flatwoods, uplands	A
35S/30E/19-20	Prairie, 3rd rate sand	Flatwoods	A
35S/30E/19-30	Prairie & pine of 3rd rate	Flatwoods, uplands	A
35S/30E/20-21	Pine & prairie, 3rd rate sand, edge of swamp (maple)	Flatwoods, wet prairie	A

Table C-3. Comparison of Field Observations of Historic Vegetation with Soil-Inferred Vegetation Communities (Continuation).

Township/Range/ Section	1870 GLO Field Survey¹	Soil-Inferred Pre- Drainage Vegetation²	Agreement³
35S/30E/20-29	Prairie	Wet prairie	A
35S/30E/21-22	No survey	Wet prairie	I
35S/30E/21-28	No survey	Wet prairie, water	I
35S/30E/22-23	No survey	Water (lake)	I
35S/30E/28-29	No survey	Wet prairie, water	I
35S/30E/29-32	Swamp, lake edge	Wet prairie	P
35S/30E/29-30	Prairie of 3rd rate, pineland	Upland, wet prairie	A
35S/30E/30-31	Leslie Creek, swamp	Wetlands	A
35S/30E/31-32	Swamp, Leslie Creek	Wet prairie	P
35S/30E/31 & 36S/30E/6	No data	Highlands	I
35S/30E/32 & 36S/30E/5	No data	Wetlands	I
36S/30E/3-4	Lake, fringing swamp	Wet prairie	P
36S/30E/4-9	No data	Highlands, uplands	I
36S/30E/4-5	Bay swamp	Flatwoods	D
36S/30E/5-8	Sand ridges	Flatwoods, wet prairie	A
36S/30E/5-6	Bay swamp	Highlands	D
36S/30E/7-8	Bay swamp, sand, pine	Highlands	P
36S/30E/7-18	Sand ridge, low scrub	Highlands, wetlands	A
36S/30E/8-9	Low sand ridges	Flatwoods	A
36S/30E/8-17	Pines, swampy creek bed	Flatwoods, uplands	P
36S/30E/9-10	Creek bed	Wet prairie	P
36S/30E/9-16	Level sand with scrub	Uplands, wetlands	A
36S/30E/10-15	Sand and low scrub	Water, wetlands	D
36S/30E/15-16	Bay swamp	Wetlands, wet prairie	A
36S/30E/16-21	Sand ridges to lake shore (L. Cram)	Wet prairie, uplands	A
36S/30E/16-17	Saw palmetto	Wetlands, wet prairie	P
36S/30E/17-20	High sand ridges, scrub, L. Apthorp, saw palmetto	Uplands, flatwoods	A
36S/30E/17-18	Lake (Apthorp)	Wet prairie, wetlands	P
36S/30E/18-19	Saw palmetto	Highlands	A
36S/30E/19-20	Sand ridges, low scrub	Flatwoods	P
36S/30E/19-30	Scrub, sand	Flatwoods, uplands	A
36S/30E/20-21	Low sand ridges	Flatwoods	A
36S/30E/20-29	Lake edge	Wet prairie	P
36S/30E/21-22	Low sand hills	Wet prairie	D
36S/30E/21-28	Creek bed, lake (Cram), low scrub	Uplands, wetlands	A
36S/30E/22-23	Low sand hills, palmetto prairie	Highlands	A
36S/30E/22-27	Creek bed, low palmetto prairie	Wet prairie, water	A
36S/30E/25-36	No data	Water, wetlands	I
36S/30E/26-27	Saw palmetto	Water	D

Table C-3. Comparison of Field Observations of Historic Vegetation with Soil-Inferred Vegetation Communities (Continuation).

Township/Range/ Section	1870 GLO Field Survey¹	Soil-Inferred Pre- Drainage Vegetation²	Agreement³
36S/30E/27-34	Saw palmetto low prairie	Wet prairie	A
36S/30E/27-28	Sand ridge, palmettos, lakes	Wet prairie	P
36S/30E/28-33	Low sand ridge	Highlands	A
36S/30E/28-29	Lake Clay, boggy prairie	Highlands, wet prairie	P
36S/30E/29-32	Lake Clay, low scrub	Water	P
36S/30E/29-30	Scrub	Wet prairie	D
36S/30E/30-31	Sand ridge, low scrub	N/A	I
36S/30E/31-32	Scrub	Highlands	A
36S/30E/32-33	Pine, boggy prairie	Highlands	P
36S/30E/32 & 37S/30E/5	Level scrub, low prairie	Highlands, wetlands, water	P
36S/30E/33-34	Sand ridge	Highlands	A
36S/30E/33 & 37S/30E/4	Pine, scrub, low palmetto	Highlands	A
36S/30E/34-35	Low pinelands	Water, wetlands	A
36S/30E/34 & 37S/30E/3	Bay swamp, scrub	Wetlands, Highlands	A
36S/30E/35-36	Bay swamp, impassible swamp	Water, wetlands	A
36S/30E/35 & 37S/30E/2	Bay swamp, impassible swamp	Water, wetlands	A
36S/30E/36	No survey	Wetlands	I
36S/31E/1 & 36S/32E/6	No survey	Flatwoods	I
36S/31E/1-12	Sawgrass, 2nd rate prairie	Flatwoods, wet prairie	A
36S/31E/1-2	Inundated	Wetlands	A
36S/31E/2-11	Sawgrass, water	Wetlands	A
36S/31E/2-3	No data	Flatwoods, wetlands	I
36S/31E/3-10	No data	Wetlands	I
36S/31E/10-11	Sawgrass, water	Wet prairie	P
36S/31E/11-12	Sawgrass, water	Wetlands	A
36S/31E/11-14	Sawgrass, water	Wetlands	A
36S/31E/12 & 36S/32E/7	Sawgrass, water	Flatwoods	D
36S/31E/12-13	Sawgrass, water	Wet prairie	P
36S/31E/13- & 36S/32E/18	No data	Wetlands, wet prairie	I
36S/31E/13-24	Inundated	Flatwoods, wet prairie, wetlands	P
36S/31E/13-14	Inundated	Wet prairie, flatwoods	P
36S/31E/14-22	Sawgrass, water	Wetlands, wet prairie, flatwoods	P
36S/31E/14-15	Inundated	Wetlands	A
36S/31E/22-23	Inundated	Wetlands	A
36S/31E/23-24	Inundated	Wetlands, wet prairie	A

Table C-3. Comparison of Field Observations of Historic Vegetation with Soil-Inferred Vegetation Communities (Continuation).

Township/Range/ Section	1870 GLO Field Survey¹	Soil-Inferred Pre- Drainage Vegetation²	Agreement³
36S/31E/23-26	Low lands	Wetlands, wet prairie	A
36S/31E/24 & 36S/32E/19	Sawgrass, low prairie, ponds	Wetlands, wet prairie, flatwoods	A
36S/31E/24-25	Sawgrass, low prairie, ponds	Wetlands	A
36S/31E/25 & 36S/32E/30	Ponds, prairie, marsh	Wet prairie, flatwoods	A
36S/31E/25-36	2nd rate prairie	Flatwoods, wetlands	A
36S/31E/25-26	Ponds, prairie, marsh	Wetlands, wet prairie, flatwoods	A
36S/31E/26-35	2nd rate prairie, cabbage palm	Flatwoods	A
36S/31E/26-27	Marsh, 2nd rate prairie, cabbage palm	Wetlands, wet prairie	A
36S/31E/34-35	2nd rate prairie, cabbage palm	Wet Prairie	A
36S/31E/35-36	No data	Flatwoods	I
36S/31E/35 & 37S/31E/2	No data	Wetlands, wet prairie	I
36S/31E/36 & 36S/32E/31	No data	Wetlands, flatwoods	I

1. General Land Office Field Notes, 1870.

2. From Zahina *et al.*, 2001.

3. A=agreement, D=disagreement, P=partial, I=insufficient data to determine.

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